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25X1

April 2, 1962

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Attention: 

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Gentlemen:

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is pleased to submit proposal  for your evaluation. Our proposal consists of the following attachments; (1) three copies of the Technical Proposal, and (2) three copies of the Fixed Price quotation. Delivery on Phase I will be four months after receipt of the order, Phase II will be eight months after Phase I.

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If during your evaluation additional information is required, questions of a technical nature should be directed to . The undersigned will be happy to assist with financial or administrative details.

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Very truly yours,

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JFK/sc

Encls.

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## D.R.-1 TECHNICAL DESCRIPTION

The DR-1 is a solid state subminiature breakout and display device for a digitally coded data link. The proposed device is a copy of the unit described in Specification No. 62-A-1140-A with modifications to reduce complexity and increase reliability. Major modifications include: replacing 32 transistors with low voltage microminiature diodes, utilizing a master printed circuit board to reduce wiring, and using commercially available miniature logic modules where possible.

The previous display unit used transistors instead of diodes in the number selection matrix to obtain low voltage drops in the conducting condition. Recent advances in the state of the art have produced diodes having very high conductance at low voltage.  25X1  
has constructed flip-flops and shift registers that operate at 1.0 ma of current with a 1.0 volt collector supply using the new diodes. These diodes are 0.045 inches in diameter and can replace 26 transistors used in the number selection matrix with an increase in reliability and reduction in size.

A master printed circuit board is used to mount all modules to reduce the hand wiring. This scheme requires that modules be replaced instead of repaired at the field level of maintenance. A reduction in size of the modules is necessary to allow room for the master board.

Miniature logic modules are available to reduce the over-all size. These modules are produced commercially by various companies such as Texas Instruments, Fairchild Semiconductors, Harmon-Kardon, and so forth. These units are qualified for a much more stringent environment

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than required by this unit. Texas Instrument flip-flops, for instance, are qualified from  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  and withstand shock and vibration much beyond any expected levels for this device.

To further reduce power consumption and size, Kay miniature "Pin-Lites" are used. These bulbs have light intensities equal to or greater than those used previously and are smaller in size, require half the current, and have four times the expected life. (2000 hours). The size, weight, and current drain listed in the technical specifications are maximum values. These values will be reduced wherever possible, consistent with reliability.

The proposed breakout and display unit is compatible with all receivers and data codes used with the previous display unit. The unit is constructed to conform with military specifications as outlined in Specification No. 62-A-1140-A without a demonstration of compliance.

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Technical Specifications as stated in Spec. No. 62-A-1140-A

Size - 2 x 3 x 1 in. Outside Dimensions

Power Supply - 2 to 3.2 volts @ 200 ma (2 Size D cells 1-1/4 x 2-1/4 in.)

Environment: (These specifications do not apply to the batteries in the power supply.)

Temperature	-20 to +40°C operating; -60 to +60°C storage
Relative Humidity	not to exceed 95%
Altitude	up to 15,000 feet above sea level
Vibration	5 to 500 cps @ .01" double amplitude or 2g
Shock	drop through angle of 30° to fir table using any edge as an axis

Electrical Input:

Input Impedance	2000 ohms
Signal Level	.3 volts rms to 10 volts rms  At .3 v rms the (S + N)/N voltage ratio will be at least 2:1 in a 300 to 3000 cycle bandwidth
Signal Frequencies	1000 $\pm$ 3 cps  1100 $\pm$ 3 cps

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## DELIVERABLE ITEMS

## Phase I

<u>Item</u>	<u>Quantity</u>
1. Digital Display Unit, DR-1	5 each
2. Cable, Radio Receiver to DR-1	5 each
3. Test Cable, DT-1 to DR-1	5 each
4. Power Supply Cable, External 3 Volts to DR-1	5 each
5. Spare Indicating Lamps	15 each
6. Indicating Lamp Removal Tool (if necessary)	5 each
7. (Preliminary) Instruction Manual	10 each

## Phase II

<u>Item</u>	<u>Quantity</u>
1. Digital Display Unit, DR-1	95 each
2. Cable, Radio Receiver to DR-1	95 each
3. Test Cable DT-1 to DR-1	45 each
4. Power Supply Cable, External 3 volts to DR-1	95 each
5. Spare Indicating Lamps	285 each
6. Indicating Lamp Removal Tool (if necessary)	95 each
7. Operator's Instruction Manual	150 each
8. Theory, Maintenance and Parts List Manual	50 each
9. Engineering Drawings, Reproducible	1 set
10. Engineering Drawings, Copies	2 sets
11. Production Tooling	1 lot

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